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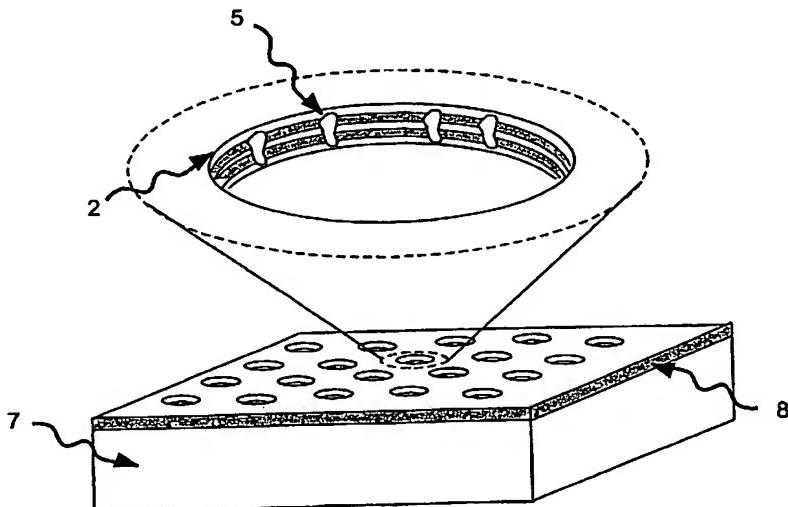
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(54) Title: NANOELECTRODE DEVICE FOR CHEMICAL ANALYSIS



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(57) Abstract: A device is provided with tunable affinity for molecules such as in particular macromolecules including proteins and peptides. The device comprises a substrate with a surface; a plurality of locally substantially parallel electrodes along said surface, wherein adjacent electrodes are separated by a distance in the range of about 0.1 nm to about 1 μm, such as about 0.3 nm to about 10 nm, where each of said electrodes is connected to a tunable EMF source, such that a specific electrostatic environment perpendicular to said electrodes is created, extending along the electrodes, and providing a continuous binding area for molecules in contact with the binding area. By tuning the independently tunable EMF sources a specific affinity or repulsion is obtainable for molecules with specific electrostatic properties. Also provided are methods for separating and isolating molecules with a device such as is disclosed herein.